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FOREST INSECT AND DISEASE CONDITIONS
IN THE LAKE STATES - 1969

By Imants Millers and James T. O'Brien

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ABSTRACT

The spruce budworm outbreak in Minnesota is continuing. Reports of new defoliation were received from Lower Michigan and Wisconsin. Jack pine budworm defoliation is decreasing. Most severe damage occurred in the northeastern part of Wisconsin. Forest tent caterpillar outbreak in Minnesota remained about the same as previous year. The Lower Michigan outbreak declined. Oak defoliation by the Archips spp. continued in Lower Michigan and tree mortality is becoming common. Elm spanworm defoliated a large area of oak in northern Wisconsin. The Saratoga spittlebug required treatment on 5000 acres in Michigan and 1000 acres in Wisconsin. New outbreaks will require treatment in Minnesota and Wisconsin. Red-headed pine sawfly is resurging after a decade of quiet. About 100 acres were treated in Michigan and four times that area is proposed for treatment in 1970. Several other minor pests of importance are mentioned.

Among the more important tree diseases is the Dutch elm disease. Elm mortality is becoming common in northern Lower Michigan. The disease is spreading in Minnesota and Wisconsin. Scleroderris canker was discovered on the Superior National Forest in Minnesota. Brown needle spot is causing problems to Wisconsin Christmas tree growers. Minnesota spruce was damaged by black spruce needle rust.

INTRODUCTION

Annual forest insect and disease condition reports for the Lake States have been made by various Federal Agencies, depending on who was most involved in pest control work. Some good, old reports are found in the files of Region 9, U.S. Forest Service and the Bureau of Entomology and Plant Quarantine. In the early 1950's the Lake States Forest Experiment Station began to publish an annual Forest Insect and Disease Situation Report in the Lake States.

With the reorganization of the pest control responsibilities in the early 1960's, the State and Private Forestry Division assumed the reporting of Lake States conditions. The entomologists assigned to the National Forests were able to meet frequently with their State counterparts and exchange information. Also, annual meetings were held in January, where insect and disease conditions were reviewed. Therefore, formal reports were de-emphasized. Mimeographed reports or even assemblage of copies of State and National Forest Reports were distributed among pest control agencies.

The centralization of State and Private Forestry in St. Paul, and a need for documentation of forest pest conditions has increased the value of a formal annual report. The objective of this report is to inform National Forest personnel and State Entomologists of insect and disease conditions in the neighboring states. For the information in this report, appreciation is herewith expressed to the many cooperators who have reported pest problems, and the State Entomologists, Messrs. G. Beach, Minn. Dept. Agr.; P. Flink, Mich. Dept. Nat. Res.; and D. Renlund, Wisc. Dept. Nat. Res.; who provided annual reports for their states.

MAJOR INSECT PESTS

SPRUCE BUDWORM, Choristoneura funiferana (Clemens)

Minnesota:

Defoliation from this infamous North American pest is increasing. Nearly $\frac{1}{2}$ million acres of spruce-fir type were defoliated in Minnesota. The severity of defoliation remained about the same as in 1968, but the boundaries of the outbreak have expanded slightly. Balsam fir mortality is becoming evident. Egg mass survey results indicate similar trend for 1970. The State of Minnesota, in cooperation with private industry and the U.S. Forest Service sprayed about 10,000 acres with 13 fl. oz. of technical malathion. Larval kill was moderate, but foliage protection was adequate and tree mortality should not be extensive in the sprayed area. No adverse effects were reported by fish and wildlife biologists.

Wisconsin:

A small outbreak occurred in Northwest Wisconsin, east of Hayward. Small pockets had severe defoliation of current shoots. Both, balsam fir and white spruce were attacked severely. Egg mass survey indicates a decline in the population for 1970.

Michigan:

Small local infestations were reported from the northern part of the Lower Peninsula. The host type is widely scattered and no serious problems are anticipated.

JACK-PINE BUDWORM, Choristoneura pinus pinus Freeman

Wisconsin:

Severe defoliation occurred in Northeast Wisconsin. Elsewhere, damage was scattered in small pockets. The 1970 forecast is for a decline in the Northeast; mostly, areas that escaped the 1968-69 damage will have defoliation. Elsewhere, the budworm situation will probably remain the same.

Michigan:

Defoliation is increasing in Lower Michigan, particularly in the Northeast. Egg mass survey suggests further increase in 1970. Defoliation decreased in Upper Michigan; the more severe damage occurred in stands not defoliated in 1967 and 1968. Continued decline is expected in 1970.

Minnesota:

Budworm defoliation declined considerably from last year. Only a few local infestations were reported, mostly from northeastern and east central parts of the State.

FOREST TENT CATERPILLAR, Malacosoma distria Hbn.

Minnesota:

More than 2000 square miles of aspen forests in northern Minnesota had some defoliation. About 200 sq. mi. were severely stripped. A small center of defoliation was found in the central part of Western Minnesota (Fergus Falls). Increased area of defoliation is predicted for 1970.

Michigan:

Hardwood defoliation in the northwestern part of Lower Michigan declined. None to light defoliation was observed throughout the last year's outbreak area.

LARGE ASPEN TORTRIX, Archips conflictana (Walker)

Minnesota:

Light to moderate defoliation was found on nearly 2000 sq. mi. in northern Minnesota. About 225 sq. mi. had more than 70% defoliation. Continued defoliation is expected in 1970.

Wisconsin:

About 70 sq. mi. in Northeast Wisconsin had light to moderate defoliation. The same is expected for 1970.

OAK LEAFROLLERS, Archips spp.

Michigan:

Oak defoliation in the northern half of Lower Michigan has occurred since 1966. In 1969, defoliation first occurred from severe late frost. Then, a few weeks later a complex of

leafroller species caused severe defoliation in the eastern part of the State. Oak mortality, primarily the northern pin-oak, Quercus ellipsoidalis, still is increasing. Indications are that severe tree mortality is likely to occur in 1970. Because of the relatively low value of oak, mainly pulpwood and ties, no control operations are anticipated.

SARATOGA SPITTLEBUG, Aphrophora saratogensis (Fitch)

Michigan:

A major spittlebug outbreak was suppressed in the Harrisville area, in the northeastern part of the state. About 5000 acres were treated with 10 fl. oz. tech. malathion per acre. Good control was obtained. A smaller outbreak, about 100 acres, were similarly treated near Gladstone, in the Upper Peninsula. A more intensive scar-count survey is planned for 1970 to locate other outbreak areas. No control is anticipated in 1970.

Minnesota:

Saratoga spittlebug damage is on the upswing on the Chippewa NF. About 200 acres have high scar-counts and supplemental surveys are planned in neighboring plantations. Chemical suppression is being considered. On the Superior N.F., detection surveys have established that the spittlebug has a potential for severe damage in the northwestern area. Systematic annual survey plans are being prepared for this area.

Wisconsin:

About 1000 acres of red pine plantations were treated in the northern part of the State. Malathion, usually as 10 fl. oz. technical material was applied from air, or 1 lb. per acre as water emulsion was applied by mistblowers. New outbreak areas were found during the fall scar-count surveys and chemical suppression is anticipated again in 1970. The total treatment acreage probably will be similar to that of 1969.

RED-HEADED PINE SAWFLY, Neodiprion lecontei (Fitch)

Michigan:

Sawfly incidence in Michigan is on the upswing after a decade of relatively low activity. About 100 acres were sprayed near Cadillac and St. Ignace with $\frac{1}{2}$ to 1 lb. of malathion per

acre applied in water with ground sprayers. No surviving larvae were found after treatment. However, sawfly populations have increased in unsprayed areas and additional spraying of about 400 acres in the State is anticipated in 1970. Two pilot tests are planned by this Field Office to obtain information needed for registering malathion against the red-headed pine sawfly.

Wisconsin:

Increased sawfly activity was reported, but no major control projects are anticipated.

PINE TUSsock MOTH, Dasychira plagiata (Walker)

Minnesota:

A small outbreak occurred in central eastern Minnesota south of Duluth. About 80 acres were treated experimentally with Matacil and Sevin. Matacil gave good control. Sevin application was troubled with clogging nozzles and no conclusive results were obtained. Hand application of Sevin on a few trees gave good larval kill. The tussock moth outbreak is expected to increase, and 1000 acres are anticipated for treatment by the State.

Wisconsin:

The anticipated outbreak in northwestern Wisconsin did not materialize. Poor weather conditions may have reduced spring larval populations.

ELM SPANWORM, Ennomos subsignarius (Hubner)

Wisconsin:

Heavy oak defoliation occurred northwest of Ashland. The outbreak apparently is on the up-swing since few reports of oak defoliation were received in 1968. The oak in the outbreak area is of low economic value and therefore chemical control of the pest is not anticipated.

OAK-LEAF SKELETONIZER, Bucculatrix ainsliella Murtfeldt

Wisconsin:

Skeletonized oak leaves were common in the western and central parts of the State. Last similar outbreak occurred in 1961. No chemical control is anticipated.

MINOR INSECT PESTS

ASPEN BLOTCH MINER, Lithocolletis tremuloidiella or L. salicifiliella Cham.

Many aspen stands along the western part of Michigan-Wisconsin Border became discolored from light green to yellow. This is the second year of the outbreak.

ASPEN LEAF BEETLES, probably Zeugophora scutellatis Suffr.

Defoliation in the north central part of Wisconsin was sufficiently severe that 32 sq. miles were mapped from the air.

BALSAM GALL MIDGE, Dasineura balsamicola (Lintner)

Balsam damage was reported in the north central part of Wisconsin. Control attempts with methoxychlor and malathion were not successful.

BIRCH SKELETONIZER, Bucculatrix canadensisella Chambers.

Light to severe birch skeletonizing was reported 50 miles on both sides of the northern part of Minnesota-Wisconsin border.

CANKERWORMS, Paleacrita vernata (Peck) and Alsophila pometaria (Harr)

An outbreak occurred in the Twin Cities of Minneapolis-St. Paul. About a 40 block area was treated with malathion and Sevin.

CHERRY SCALLOP-SHELL MOTH, Calocalpe undulata (L.)

Most of the wild cherries in the eastern half of Upper Michigan turned brown by August.

ELM LEAF BEETLES, probably Altica carinata or A. ulmi

Moderate to severe elm defoliation was reported in the north central part of Wisconsin.

EUROPEAN PINE SAWFLY, Neodiprion sertifer (Geoff.)

Defoliation in Lower Michigan declined from that of the previous year. Only a few outbreaks were reported.

EUROPEAN PINE SHOOT MOTH, Rhyacionia buoliana (Schiff.)

Shoot moth activity generally was low. Near St. Ignace, 2 red pine plantations have light damage.

JACK-PINE SAWFLY, Neodiprion pratti banksiana Rohwer

In general, populations in northern Michigan have declined.

LARCH SAWFLY, Pristiphora erichsonii (Hartig)

Tamarack defoliation was common throughout the area.

LARGE ASPEN LEAF TIER, Enargia decolor Walker

Light to moderate defoliation of open grown and small aspens was reported from the northeastern part of Minnesota.

NATIVE ELM BARK BEETLE, Hylurgopinus rufipes (Erichhoff)

Populations are high in north central Wisconsin where Dutch Elm Disease is spreading rapidly.

PINE ENGRAVER, Ips pini Say

Few scattered trees and groups of trees killed in northwestern Wisconsin.

PINE ROOT COLLAR WEEVIL, Hylobius radicis Buchanan

Generally, infestation level in the Lake States has remained the same as previous years. Damage is most severe in plantations of exotic pines, such as Scotch, Austrian, and lodgepole.

PINE ROOT TIP WEEVIL, Hylobius rhizophagus Millers et al.

The major outbreak area is still restricted to central Wisconsin. However, small outbreak areas are continuing in northern Wisconsin and in Lower Michigan.

PINE SPITTLEBUG, Aphrophora parallella (Say)

The white, frothy spittle masses were common in many jack pine stands in the Lake States, but no apparent damage is reported.

PINE TORTOISE SCALE, Toumeyella numismaticum (P. & McD.)

Observations were reported from northeast Wisconsin and eastern Upper Michigan.

PINK-STRIPED OAKWORM, Anisota virginensis (Drury)

About 5000 acres of scrub oak were defoliated in northwestern Wisconsin. The population is expected to continue but no control is planned.

ORANGE-HUMPED MAPLEWORM, Symmerista leucitys

About 1800 acres were infested in eastern Upper Michigan. Several small infestations also were reported from northwest Lower Michigan.

RED-HUMPED OAKWORM, Symmerista canicosta

An outbreak on oak occurred north of Muskegon, Michigan.

SADDLED PROMINENT, Heterocampa guttivitta (Walker)

An outbreak covering 500-1000 acres was reported from northwestern Lower Michigan. A small outbreak near Sault Ste. Marie, Upper Michigan, collapsed apparently from a virus disease.

SEED AND CONE INSECTS, primarily Conophthora resinosae Hopkins

Surveys in 10 seed production areas indicate a range of 6% to 92% cones damaged, mostly by the red-pine cone beetle.

WHITE-PINE WEEVIL, Pissodes strobi (Peck)

Damage to white and jack pine leaders was reported throughout the Lake States. Occasionally, damage in red pine plantations occurred.

FOREST DISEASES

DUTCH ELM DISEASE

Michigan:

The Dutch elm disease is rapidly eliminating elms from Lower Michigan. About 10% of elms in Alpena County were reported killed in 1969. In the Upper Peninsula, new infections were reported from Norway, Dickinson Co., and Manistique Lakes, Mackinac Co.

Minnesota:

The disease was found in 48 new municipal locations and in 7 new counties (LeSueur, Murray, Noble, Rice, St. Louis, Waseca and Watonwan). In 1969, 34 of 87 counties reported Dutch elm disease.

Wisconsin:

Six new counties (Buffalo, Dunn, Pierce, Rusk and Taylor) reported Dutch elm disease; 62 of 72 counties have the malady.

SCLERODERRIS CANKER

Minnesota:

First record of the disease in the State was reported from 2 red pine plantations on the Superior National Forest.

BROWN SPOT NEEDLE BLIGHT caused by Lecanosticta acicola (Thuem.) Syd.

Wisconsin:

This disease poses a serious threat to the Scotch pine Christmas tree plantations in western Wisconsin.

BLACK SPRUCE NEEDLE RUST caused by Chrysomyxa ledicola

Minnesota:

Defoliation of black spruce occurred in many areas in Minnesota. The damage reduced the harvest of black spruce Christmas trees.